Bridges and Structures Design Manual – Metric

Division 1

SECTION 2

BRIDGE TERMS

The following is a list of bridge terms usually found in bridge plans or referred to in bridge construction:

ABUTMENT

The portion of the bridge substructure at either end of a bridge which transfers loads from the superstructure to the foundation and provides lateral support for embankment.

ALIGNMENT BEARING

A bearing recessed in a bridge seat to prevent transverse movement of the superstructure. Normally, one beam on each span has an alignment bearing. It does not incorporate bronze plates used on other bearings (see BEARING).

BACKWALL

The portion of an abutment behind the bridge seats which extends upward from the top of the bridge seats to the top of the abutment or bottom of the header.

BATTER

A deviation from the vertical, commonly found on the back sides of walls and on piles.

BEARING

Usually, a device which supports the end of a girder and distributes superstructure loads to the abutment or pier. Fixed bearings do not provide for longitudinal movement of the superstructure to compensate for expansion and contraction due to temperature changes.

BENT

A row or group of piles in a structure, a row of columns. Piers are also referred to as bents when the piles extend above the ground to the pier cap.

BORING

An exploration of subsurface material. Borings are used by the Design Engineer in determining the types and dimensions of foundations required. Borings are used by Construction personnel to determine the type of materials in which piles are to bear and to determine suitable bearing strata in foundation excavations.

BORROW EXCAVATION, BRIDGE FOUNDATION (BEBF)

Select compacted material used for foundations.

BRIDGE SEAT

The horizontal surface on an abutment or pier on which the girders are to be supported.

BULKHEAD

1. Usually, bulkheads (timber, concrete, or steel sheeting) are constructed adjacent to railroads or waterways to retain embankments or prevent erosion.

2. A temporary vertical form at a construction, contraction or expansion joint.

CAMBER

A slight parabolic curvature constructed into a girder to:

1. Compensate for deflections in the girder due to the weight of the girder and weight of concrete supported by it.

2. Provide curvature to the superstructure if the roadway profile is on a vertical curve.

3. Provide architectural curvature to the girder.

CAP BEAM

A steel, timber or concrete beam capping a bent of piles or columns.

CENTERLINE OF BEARINGS

A horizontal alignment control line through the centers of the bearings which is used in abutment or pier layout and girder erection.

CHAMFER

The inclined flat surface formed by removing a square edge or corner; a beveled edge.

COLUMN

A vertical compression member usually circular or rectangular in cross section. In piers, columns transfer loads from the superstructure to the footing foundation.

CONSTRUCTION JOINT

A joint where adjacent portions of the structure are joined together. This is usually roughly finished and has reinforcement steel extending through it.

Abbreviation: Const. Jt.

CONTRACTION JOINT

A joint which separates two adjacent portions of the structure and contains a bond break such as a paraffin coating.
Abbreviation: Contr. Jt.

COPING

A projecting decorative course of concrete. Usually, this is a projection on the outside of bridge sidewalks. It is also found on wingwalls of stub abutments and some pier cap beams.

CUTOFF WALL

A type of concrete header constructed under headwall aprons, culvert invert slabs and culvert wingwall footings to prevent washouts caused by scouring action of the water.

DIAPHRAGM

1. Channel or angle steel cross bracing between steel girders.

2. Cast-in-place concrete bracing between prestressed concrete beams.

DOWEL

A reinforcement bar extending through a construction joint connecting two adjacent portions of the structure.

ELEVATION VIEW

A front or side view.

EXPANSION JOINT

A joint which separates two adjacent portions of a structure and contains compressible material to allow for concrete expansion. *Abbr.: Exp. Jt.*

FASCIA BEAMS

The outermost girders on any span.

FLANGE

The projecting portion of a beam or channel. The top or the bottom plate of a steel girder.

FOOTING

Part of a foundation, normally wider than the supported wall or column, which transmits loads from above to the soil below either by direct contact or through piles.

FOUNDATION

The part of a structure which is usually placed below the surface of the ground which distributes the load upon the subsoil.

GIRDER

A horizontal supporting structural member. (Beam, Stringer)

HEADER

A concrete wall on the top of an abutment backwall usually found between the end of a deck slab and the roadway approach slab.

INTEGRAL ABUTMENT BRIDGE

A bridge whose superstructure is rigidly connected to its abutments.

LIFE CYCLE COST

The total cost of an item's ownership over a specified period of time. For NJDOT Bridge Projects, this period will be 75 years. This includes initial acqusition costs (right of way, planning, design, construction), operation, maintenance, modification, replacement, demolition, financing, taxes, disposal and salvage value as applicable.

PARAPET

A concrete railing or barrier located on the bridge deck fascia and the tops of retaining walls.

PIER

The portion of the bridge substructure which transfers loads from the superstructure to the foundation. Provides intermediate support for multi-span bridges.

PILES

Shafts of concrete, timber, or steel which are used to transfer foundation loads through subsurface materials of low bearing capacity to materials of higher capacity.

PITCH

The vertical distance covered by one turn of spiral reinforcement in columns.

PLAN VIEW

Top view

RETAINING WALL

A wall designed to retain embankment and prevent erosion.

SECTION VIEW

An internal view. In Bridge Plans, sections are usually shown through all parts of the structure.

SHEAR CONNECTORS

Usually stud type connectors welded to the top of girders or U type reinforcement protruding from prestressed concrete beams and embedded in the concrete deck slabs.

SOFFIT

The underside portion of a deck slab overhanging the exterior of fascia girders.

STIFFENER

Longitudinal or vertical plates (welded to structural steel beams) to prevent buckling.

SUBSTRUCTURE

The part of a structure below the superstructure.

SUPERSTRUCTURE

In a bridge, the superstructure consists of bearings, girders, decks, sidewalks, etc. (All above the substructure).

WINGWALL

A wall at the end of an abutment or culvert for retaining slopes and preventing erosion.

VIADUCT

A bridge made up of multi-spans supported on piers carrying the roadway over streets, highways, railroads and/or streams.